Thirdly, that those which they call the eyes of Crabs, Lobsters, Shrimps, and the like, and are really so, are *Hemisphær'd*, almost in the same manner as these of Flies are. And that they really are so, I have very often try'd, by cutting off these little movable knobs, and putting the creature again into the water, that it would swim to and fro, and move up and down as well as before, but would often hit it self against the rocks or stones; and though I put my hand just before its head, it would not at all start or fly back till I touch'd it, whereas whil'st those were remaining, it would start back, and avoid my hand or a stick at a good distance before it touch'd it. And if in *crustaceous* Sea-animals, then it seems very probable also, that these knobs are the eyes in *crustaceous* Insects, which are also of the same kind, onely in a higher and more active Element; this the conformity or congruity of many other parts common to either of them, will strongly argue, their *crustaceous* armour, their number of leggs, which are six, beside the two great claws, which answer to the wings in Insects; and in all kind of Spiders, as also in many other Insects that want wings, we shall find the compleat number of them, and not onely the number, but the very shape, figure, joints, and claws of Lobsters and Crabs, as is evident in Scorpions and Spiders, as is visible in the second *Figure* of the 31. *Scheme*, and in the little Mite-worm, which I call a Land-crab, describ'd in the second Figure of the 33. *Scheme*, but in their manner of generation being oviparous, *&c.* And it were very worthy observation, whether there be not some kinds of transformation and metamorphosis in the several states of *crustaceous* water-animals, as there is in several sorts of Insects; for if such could be met with, the progress of the variations would be much more conspicuous in those larger Animals, then they can be in any kind of Insects our colder Climate affords.

These being their eyes, it affords us a very pretty Speculation to contemplate their manner of vision, which, as it is very differing from that of *biocular* Animals, so is it not less admirable.

That each of these Pearls or *Hemispheres* is a perfect eye, I think we need not doubt, if we consider onely the outside or figure of any one of them, for they being each of them cover'd with a transparent protuberant *Cornea*, and containing a liquor within them, resembling the watry or glassie humours of the eye, must necessarily refract all the parallel Rays that fall on them out of the air, into a point not farr distant within them, where (in all probability) the *Retina* of the eye is placed, and that opacous, dark, and mucous inward coat that (I formerly shew'd) I found to subtend the concave part of the cluster is very likely to be that *tunicle* or coat, it appearing through the *Microscope* to be plac'd a little more than a Diameter of those Pearls below or within the *tunica cornea*. And if so, then is there in all probability, a little Picture or Image of the objects without, painted or made at the bottom of the *Retina* against every one of those Pearls, so that there are as many impressions on the *Retina* or opacous skin, as there are Pearls or *Hemispheres* on the cluster. But because it is impossible for any protuberant surface whatsoever, whether *sphærial* or other, so to refract the Rays that come from farr remote *lateral*

lateral points of any Object as to collect them agai
in a distinct point, and that onely those Rays which
that lies in the *Axis* of the Figure produc'd, a
fracted to one and the same point again, and that th
ther they are remov'd, the more imperfect is their
It follows therefore, that onely the Picture of those
objects that lie in, or neer, the *Axis* of each *Hemisp*
painted or made on the *Retina* of each *Hemisphere*
each of them can distinctly sensate or see onely those
neer perpendicularly oppos'd to it, or lie in or
Now, though there may be by each of these eye-p
to the Animal of a whole *Hemisphere* in the same ma
there is a picture or sensation in the *Retina* of all th
in an *Hemisphere*; yet, as in a man's eye also, there
few points which liyng in, or neer, the optick *A*
cern'd: So there may be multitudes of Pictures m
the several Pearls, and yet but one, or some very
The representation of any object that is made in any
which is directly, or very neer directly, oppos'd, being
and unable to produce a distinct vision.

So that we see, that though it has pleas'd the All
due this creature with such multitudes of eyes, yet
with the faculty of seeing more then another creatu
cannot move his head, at least can move it very little
whole body, *biocular* creatures can in an instant (o
eye, which, being very quick, is vulgarly used in th
move their eyes so as to direct the optick *Axis* to
probable, that they are able to see attentively at one
Physical point; for though there be a distinct Imag
yet 'tis very likely, that the observing faculty is only
one object for which they have most concern.

Now, as we accurately distinguish the site or po
by the motion of the Muscles of the eye requisite to
in a direct position, and confusedly by the position of t
of the object at the bottom of the eye; so are these
able to judge confusedly of the position of objects b
pression made at the bottom of the opposite Pearl,
removal of the attentive or observing faculty, from o
but what this faculty is, as it requires another place, so
culation. Now, because it were impossible, even with t
balls, to see any object distinct (for as I hinted before, o
lay in, or very neer, the optick Lines could be so) the In
has not left the creature without a power of moving
Aerial crustaceous animals, and the very eyes also in *cru*
so that by these means they are inabled to direct some
against any object, and by that means they have the v
pleat as any Animal that can move its eyes.

ROBERT HOOKE *Micrographia* LONDON, 1665 THE WARNOCK LIBRARY Octavo